SCIENTIFIC INSTRUMENTS

COMPONENT MAINTENANCE MANUAL

TEMPERATURE SENSOR

Part Number
B7180

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RECORD OF REVISIONS

REVISION	REVISION DATE	INSERTION		REVISION	REVISION DATE	INSERTION	
		DATE	BY			DATE	BY
1	11/30/98						
2	04/17/91						
3	03/17/95						
4	11/10/99						
5	01/22/04						

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INTRODUCTION

This manual describes the general configuration of the Pack/Zone Temperature Control Sensor, Model B7180, manufactured by Scientific Instruments, Inc. Identification data, including part number, serial number, and FAA-PMA data, is engraved on the body of the unit.

This manual is divided into separate sections.

Title Page	Testing and Fault Isolation
Record of Revisions	Disassembly
Record of Temporary Revisions	Cleaning
Service Bulletin Information List	Check
List of Effective Pages	Repair
Table of Contents	Assembly including Storage
Introduction	Fits and Clearances
Description and Operation	Special Tools, Fixtures, and Equipment
Specifications	Illustrated Parts List

Refer to the Table of Contents for the page location of applicable sections.

The quantities in this manual are expressed in English units followed by S.I. units in parenthesis.

This manual will be revised as necessary to reflect current information.

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DESCRIPTION AND OPERATION

1. DESCRIPTION

The Pack/Zone Temperature Control Sensor consists of two calibrated thermistors, which are mounted within a stainless steel housing. These thermistors are terminated in a 6-pin hermetically sealed receptacle, which connects to the external temperature control system. Mounting of the unit is accomplished via an external 5/8 – 18 threaded section and hex head configuration as shown in Figure 1.

2. OPERATION

The thermistors respond to changes in air duct temperature and provide an output inversely proportional to these changes. The associated temperature controller utilizes this output to regulate the temperature of the duct air.

Three curved vanes are incorporated in the design of the sensor tip. Their function is to protect the thermistors from foreign matter in the airflow, while directing the flow throughout the thermistor area. This prevents air stagnation, which could affect accuracy of the sensor output.

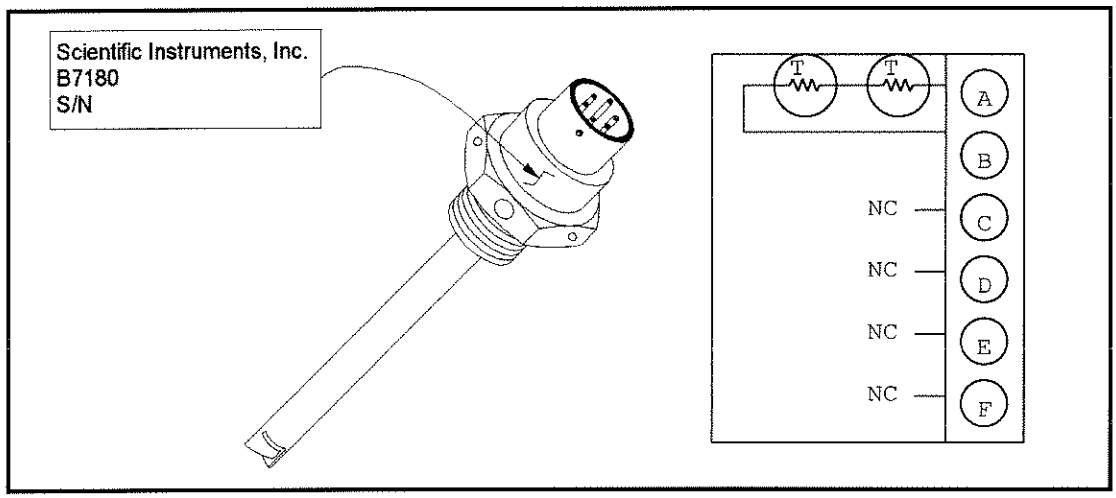
The thermistor-to-receptacle connections are as illustrated in Figure 1.

3. SPECIFICATIONS

Receptacle:	MS3113H10C6P (or equivalent per MIL-C-26482)
*Mating Bayonet Plug:	MS3116F106S (or equivalent)
Weight:	3 oz (0.09 kg)
Size:	
Probe Diameter:	0.28 in. (7.1 mm)
Overall Length:	4.00 in. (101.6 mm) maximum
Mounting Thread:	5/8 – 18 UNF 3A

Mounting Hexagon: 1.00 in. (25.4 mm) across flats

* This plug is listed for test purposes only, and is not necessarily used on the aircraft.



Outline and Schematic Drawing

Figure 1

TESTING AND FAULT ISOLATION

4. TESTING AND FAULT ISOLATION

A. The data that follows permits the testing of the sensor to insure correct operation.

B. Special Tools and Test Equipment

1) A megohmeter capable of reading 5 megohms and greater at 500 VDC (AEMC Model 1000, or equivalent)

2) Temperature-controlled environmental test chamber. Accuracy 1%.

3) Thermometer with temperature accuracy ± 0.2°F (± 0.11°C)

4) Ohmmeter with:

Current: <0.1 mA

Accuracy: 0.05%

Range: 0-100 KΩ

C. Visual Check

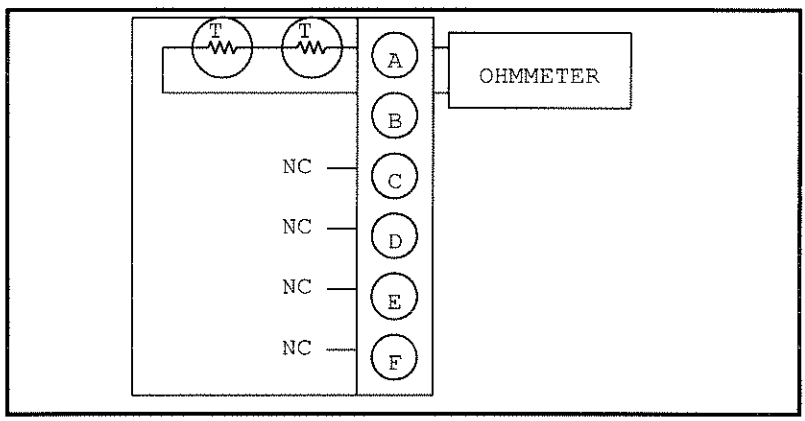
1) Visually check the sensor for obvious damage.

D. Insulation Resistance

1) Using the megohmeter, measure the resistance between all receptacle pins connected in parallel and the housing. The reading should exceed 10 megohms @ 500 VDC.

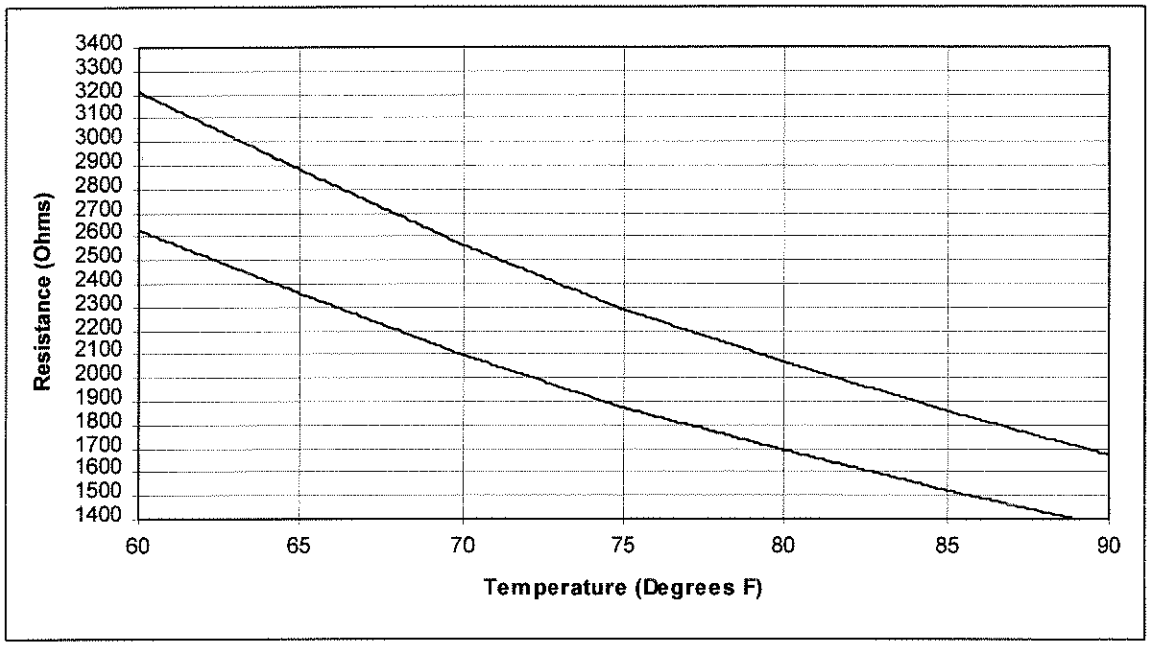
E. Electrical Test (refer to Figure 2)

1) Connect the Ohmmeter to pins A & B of the temperature sensor. Hold the sensor at a temperature of 75°F ± 10°F (23.9°C ± 5.6°C), within the environmental test chamber. With the thermometer at a stable temperature and located within approximately 1/2 in. (12.7 mm) of the tip of the sensor, measure the temperature. Compare this value to that indicated on Figure 3. The value must be within the limits shown on the drawing.



Schematic for Electrical Test

Figure 2



Resistance vs Temperature

Figure 3

5. DISASSEMBLY

   Not Applicable

6. CLEANING

   A. Remove dirt, stains, moisture, etc. with a clean, dry, lint-free cloth.

   B. Use a soft bristle brush moistened in isopropyl alcohol to remove any foreign matter from between the receptacle pins.

7. CHECK

   A. Visually inspect the sensor probe for obvious wear or damage.

   B. Check for bent, broken or missing receptacle pins.

C. Check probe housing for scratches or cracks.

8. REPAIR

The temperature sensor is considered non-repairable. Bent receptacle pins may be carefully straightened. For other defects or incorrect operation, the temperature sensor should be discarded.

9. ASSEMBLY INCLUDING STORAGE

A. Assembly

Not Applicable

B. Storage

1) Install a protective cap on the electrical connector.

2) The sensor must be stored in a clean and dry room open to the air. The temperature must be between 64°F and 82°F (18°C and 28°C) and the relative humidity between 25% and 65%.

3) Keep the sensor in its initial packaging. If other containers are put on the sensor container, be careful to prevent damage caused by too much weight.

4) Do not keep the sensor near heat, fluids or other sources that can cause corrosion.

10. FITS AND CLEARANCES

No dimensional check of the sensor is necessary.

11. SPECIAL TOOLS, FIXTURES AND EQUIPMENT

No other special tools are necessary.

12. ILLUSTRATED PARTS LIST

Since the unit is non-repairable, no parts list is provided.